

Do We Give It to Them, and What Happens If We Do?

Issues Concerning Technology Transfers

**A Monograph
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Do We Give It to Them, and What Happens If We Do? Issues Concerning
Technology Transfers

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Abstract

DO WE GIVE IT TO THE, AND WHAT HAPPENS IF WE DO? ISSUES CONCERNING TECHNOLOGY TRANSFER By MAJ Roy L Tisdale, US Army, 51 pages.

What happens when a technologically advanced nation provides advanced technology to a much less advanced nation's military? Numerous political and diplomatic considerations go into the decision to provide the technology, but once the decision is made, military leaders somewhere will find themselves dealing with the process and its effects. This paper analyzes some of the considerations for developing the plan of implementation, training and sustainment of new technology in the hands of less technologically developed militaries. The analysis divides the considerations into the categories of: capabilities (how well the country's infrastructure can sustain the new technology), foundations (the academic environment in the host country), and traditions (how culture might impact adopting new technology). Armed with this understanding, leaders charged with transferring new technology, training indigenous forces, or working with coalition forces with newly acquired technology should be better prepared to deal with the unique challenges the recipient military may face.

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INTRODUCTION

Transferring military technology to another nation's military forces carries with it numerous considerations and implications from the international down to the individual user level. Once policy and legal requirements have been met allowing the technology exchange to take place, executors of the exchange must consider matters of implementation and effectiveness, as well as the long-term potentials of the program.

What are the effects of a technologically advanced military force transferring its advanced technology to a more primitively equipped foreign force? The transfer can be counterproductive for either or both parties if cultural, educational and infrastructure dissimilarities are not recognized and addressed. Leaders at all levels that are cognizant of these potential conditions and impacts will be better prepared to deal with these complexities.

In this paper, three social aspects will be explored for evaluating the potential for successful technology transfers to foreign military forces. These three aspects are: *capabilities*, defined as the operational and logistical sustainability infrastructure within the recipient country and military; *foundation*, defined as the educational foundation of the recipient country; and *tradition*, defined as cultural influences inherent to the recipient country and military.

Why is this issue important? The National Security Strategy of the United States of America¹, the National Military Strategy of the United States of America², and the 2006 Quadrennial Defense Review Report (QDR)³ all speak of building international partnership capabilities to enhance global security. Based on these documents, one primary theme of the U.S. national policy is to assist allied military and security forces with improving their capabilities to

¹ *The National Security Strategy of the United States of America* (Washington: U.S. Government Printing Office, 2006). Partnership capabilities and acting with partner countries is implied throughout the NSS, thus further implying potentials for sharing technology with foreign militaries.

² *The National Military Strategy of the United States of America* (Washington: U.S. Government Printing Office, 2004).

³ *Quadrennial Defense Review Report* (Washington: U.S. Government Printing Office, 2006), 87-91.

secure themselves, promote internal stability, and defeat terrorist threats. The QDR further describes the intent for the U.S. Department of Defense to provide advanced technology and the requisite training to foreign allies and partners⁴. The Department of Defense *Security Assistance Management Manual, DoD 5105.38-M (SAMM)* outlines the U.S. security assistance program with emphasis on the transfer of equipment and training.⁵

Besides the direct and indirect security benefits of transferring military technology, the military-industrial complex relies on these activities for economic reasons. Without the prospect of potential international consumers, the productivity and viability of defense production capabilities might be significantly curtailed. Two examples of this potential impact of foreign military sales on security and economic sustainability are production costs and production viability.

First, the production costs of a defense item may be too formidable to enable production or sufficient fielding of the item. For example, the original B-2 bomber order of 100 units was roughly \$300 million per aircraft. Post Cold-War era requirements reduced that original order to only 21 aircraft, pushing the actual cost of production per unit to an estimated \$2.2 billion due to the significant loss in economies of scale.⁶

Second, without foreign military sales, production viability of some defense items may at times be jeopardized. For instance in 1995, five major weapon systems were scheduled to be sold almost entirely to foreign countries: the F-15 and F-16 jet fighter aircraft, the Patriot surface-to-

⁴ *Quadrennial Defense Review Report* (Washington: U.S. Government Printing Office, 2006), 90.

⁵ U.S. Department of Defense. *Security Assistance Management Manual, DoD 5105.38-M*, October 3, 2003 (Washington: Defense Security Cooperation Agency, 2003). The purpose of this program as described by the manual compliments the guidance mentioned on the previous national directives, stating that by transferring such material and knowledge to partners and allies to ensure their security and economic well-being, the U.S. helps ensure its own security and economic well-being.⁵ The *SAMM* outlines, among other things, current country and international organization eligibility for security assistance, and what may and may not be purchased.

⁶ Wayne M. Johnson, LTC, USAF, *Seller Beware: U.S. International Technology Transfer and Its Impact on National Security* (Maxwell Air Force Base, Alabama: Air War College, 1998), 19.

air missile system, the Apache attack helicopter and the Blackhawk utility helicopter. Foreign military sales of these items were the only thing keeping the production of those systems open, implying that without foreign sales, the production lines would have closed. Furthermore, had these production lines closed, the U.S. military would have had no reconstitution capability in time of a crisis such as the break-out of high intensity conflict like Desert Shield/Desert Storm or the invasion phases of Operations Iraqi Freedom and Enduring Freedom. Likewise, sustained operations such as Operation Noble Anvil in Kosovo and the subsequent phases of Operations Iraqi Freedom and Enduring Freedom might have been jeopardized. In fact, it was predicted that F-16 and F-15 production would have ceased altogether if not for the purchases of these aircraft by Taiwan, Saudi Arabia and Israel.⁷ Both aircraft production lines remain open as of the publishing of this paper in order to fill production orders from foreign customers.⁸

Not only could the prohibitive cost or lack of sufficient demand potentially cease production of a system, but with that cessation comes potential for the loss of sufficient spare parts supplies. Sales to foreign militaries help to reduce the overall cost per unit thereby enabling the U.S. military, as well as other customers, to purchase more systems. Greater demand for the more affordable system helps to keep the production lines open. Keeping the production lines open provides the resource to procure more systems if the need arises and helps to ensure availability of parts and upgrades to older systems as production modifications occur. All of these related activities provide for a stronger military capability and military-industrial complex.

⁷ William J. Del Grego, MAL, USAF, *The Diffusion of Military Technologies to Foreign Nations: Arms Transfers Can Preserve the Defense Technological and Industrial Base* (Maxwell Air Force Base, Alabama: Air University Press, 1996), 33.

⁸ Orders from Singapore and South Korea extend the F-15 production into 2009, (Boeing, "F-15E Overview (January 2006)," http://www.boeing.com/defense-space/military/f15/docs/F-15E_overview.pdf (accessed February 23, 2008)), and a Pakistan order extends the F-16 production through 2008, (F-16.Net, "Pakistan Expects F-16s by End of 2008," Lieven Dewitte, http://www.f-16.net/news_article2464.html (accessed February 23, 2008)).

How does all this relate to the military leader at the strategic, operational and tactical levels?

Besides being familiar with how technology transfers affect national security and defense industry, leaders must recognize that the national-level policies regarding building partner capabilities implies a likelihood of being a part of that process at some point in a military career. Very few military leaders will likely ever find themselves involved with the national strategic decisions and implementation of technology transfer to foreign countries. However, leaders in the current force, and those in the foreseeable future force, will likely be involved at the operational and tactical levels with the direct implementation of technology transfer. This exposure may come by way of advising and/or training foreign forces, or during coalition operations by way of working with foreign forces possessing newly acquired advanced technologies. Understanding some of the potential effects and some of their possible causes may better prepare these leaders to capitalize on opportunities and mitigate obstacles when involved in such activities.

CONTEXT

For the purposes of this paper, the term 'sponsor' is defined as the force or nation providing the technology and any accompanying resources, and the 'host' is the force or nation receiving the technology and accompanying resources. By the nature of the mission, the sponsor force is typically the more advanced in terms of technology, doctrine and overall force capability. This does not however imply that the host nation force is inferior in all areas. On the contrary, the host nation force oftentimes brings invaluable capabilities that the sponsor force may never reach in terms of familiarity with the people, culture, language and terrain. In addition, this inherent knowledge typically leads to customized tactics, techniques and procedures that the sponsor force may regard as better suited for the environment than what its doctrine prescribes.

Additionally, one must differentiate between the concepts of supplying 'technology' versus 'equipping'. For the purposes of this paper, 'equipping' refers to providing a range of material, which might also include advanced technology, but is focused on providing a *quantity* of resources which the host nation is unable to reasonably provide for itself. 'Providing technology', involves providing *scientifically advanced methods* and *material* which the host nation is unable to reasonably provide for itself. In summary, it is a matter of quantity versus quality. Recognizing the differences between these two concepts is important so as not to misconstrue the ideas of supplying a force with beans and bullets, for example, and supplying them with encrypted communications and extended real-time Intelligence Surveillance and Reconnaissance (ISR) assets. Differentiation between these two concepts is especially important at political levels. 'Equipping' a foreign force equates to a wide spectrum of possibilities ranging from providing simple material such as food and clothing to advanced weaponry. It is on this 'advanced' end that policy becomes even more important and equally more complicated. It is also on this 'advanced' end of the spectrum where the transferability of technology becomes more complicated and is the element at the heart of this paper.

As for policy and principles concerning transferring technology, two assumptions are necessary to proceed. First, to avoid turning this document into a debate on correctness of policy and morality of the activities, the research assumes that current policy was acceptable and that historical and hypothetical examples and the case studies met all appropriate policy requirements. Second, the examples and case studies are not viewed from the perspective of right or wrong, or whether they meet national objectives. These cases and examples are assumed to suitably meet national objectives. Without these assumptions, too many matters of policy and morality would cloud the intent of this paper to provide understanding of the effects of approved transfers.

A point of clarification is necessary for two words with similar meanings, but which may be mistakenly interchanged. The first, 'adopt' means 'to choose or take as one's own'.⁹ The second, 'adapt', means 'to make suitable to requirements or conditions; adjust or modify fittingly'.¹⁰ Each use of these two words and their derivatives has been carefully considered to fit the context of the statement. The author's intent was to use the word 'adopt' in relation to newly received technology, whether it is invented or given, whereas 'adapt' was intended to reference technology, new or otherwise, that was modified in form, function, or use to fit the recipient's desires. This point of clarification is necessary when one considers factors affecting the fate of an innovation.

The historical case studies explored within this paper are set within the counterinsurgency environment. This is not a deliberate focus on technology as it relates to the counterinsurgency environment, but instead a reflection of the environment that the U.S. military currently faces, and the anticipation of continued emphasis on building partner capabilities and conducting coalition operations for the foreseeable future. Some, if not all, of the concepts developed can likely be applied to any military operation and mission involving transferring technology, or working with less developed forces, which have recently acquired advanced equipment.

Additionally, a significant portion of the sources cited in this document reference Arab countries in general, and Iraq specifically, as examples from which to attempt to draw conclusions. This was due purely to the readily available pool of sources oriented on, or with experience in, the Arab region. Two disclaimers are necessary regarding this apparent emphasis, and the reader should keep these in mind throughout the document. First, to assign generalizations to the whole of a diverse people of a region is to court contradiction and invite

⁹ Lexico Publishing Group, LLC., "Dictionary.com," <http://dictionary.reference.com/browse/adopt> (accessed January 14, 2008).

¹⁰ Lexico Publishing Group, LLC., "Dictionary.com," <http://dictionary.reference.com/browse/adapt> (accessed January 14, 2008).

controversy. Within the category of 'Arabs' lays an array of subcultures with diverse histories, thoughts and social norms. That being said, numerous scholars have affixed different cultural values to this broad category of people, just as they have to other demographic groups, as general tendencies of the members of the referenced population. This author recognizes that great exceptions to these generalities exist, but that there is still value in identifying the general tendencies of a population in order to better understand how to interact. Second, the emphasis on Arab culture is in no way a means to level disparaging charges at that population as a whole or in parts. Value judgments are based on the perspective and the author has attempted to refrain from making such judgments¹¹. Any such implied criticism is unintended.

If academically feasible, the references to specific nationalities, societies, and events would not appear in the text, but instead the observations would be referred to as anonymous accounts of unidentified events, parties and research that the reader would have to trust actually occurred. Professional scholarship demands otherwise. The author asks that readers take these specific references to cultures and nations purely for scholarly purposes, and consider for academic value only the refined observations, theories of causation, and conclusions. The author contends that the real value to be derived from this work is not in the assessment of particular societies, militaries or events, but rather a better understanding of potential considerations for, in general, working with people of other cultures, and specifically, in transferring technology to people possessing less advanced means.

¹¹ Most resources referenced indicate that culture does impact behavior of the individual members of a society. The disagreements usually came in the form of interpretation of exactly how cultural impacts manifested into identifiable trends. Raphael Patai (*The Arab Mind* (New York: Hatherleigh Press, 2002)) assigns Arabs in general with persona that appears less-than-flattering to author Halim Barakat (*The Arab World: Society, Culture and State* (Berkeley: University of California Press, 1993)), yet Barakat selectively attacks Patai's opinions with little substantial counter-argument while somewhat embracing some of Patai's opinions that he presumably does not find as offensive. Other works researched included a compilation of essays edited by Lawrence Harrison and Samuel P. Huntington (*Culture Matters* (New York: Basic Books, 2000)) that focus on how culture affects economic prosperity, and Margaret K. Nydell (*Understanding Arabs: A Guide for Modern Times* (Boston: Intercultural Press, 2006)) on her book about Arab culture and modernity.

Finally, one last term must be considered within the context of this discussion. The term “success” with relation to transferring technology must be viewed from the perspectives of both the sponsor and the host. Beyond the terms and conditions agreed upon by all interested parties, the author characterized success as satisfactorily meeting the expectations of both the host and the sponsor with the process of transferring the technology, to include completing all physical transfers, training and sustainment agreement activities. Additionally, once the transfer is complete (or beyond the initial introduction of technology in the case of long term agreements such as those spanning years or decades involving sustained support)¹², the host continues to consider the new technology as satisfactorily meeting its requirements for a reasonably expected period of time. Though this loose definition of “success” would be hard to quantify, and would rest mostly in the opinion of the host, the sponsor has vested interest in the outcome and will have its own opinions of the measure of success. However, for this paper these more simplistic albeit less quantifiable concepts were employed.

EVALUATION ASPECTS

Of the countless possible lenses for observation, the elements of ‘capabilities’, ‘foundation’ and ‘tradition’ were chosen for their core influences on people and organizations. These influences result in general characteristics, which can be identified and recognized as potentially impacting organizations within the observed society. Analysis of ‘capabilities’ is for the purpose of identifying the capabilities a society and military has to maintain newly introduced technology, and operationally sustain it for the expected lifespan of the system. ‘Foundation’ considers the educational foundations within a society. Conceptually, societies which stress and provide opportunities for academic performance in an educational environment that balances formal, natural and professional sciences with humanities and social sciences would react very

¹² For example, contracts between the United States and Saudi Arabia for F-15 Strike Eagle jet fighters and M1 Abrams main battle tanks have been on-going with little to no interruption since the 1980s.

differently to advanced technology than societies with different academic environments.

‘Tradition’ relates to the traditional behaviors and inclinations of the individuals of a society based on the culture. Understandably, organizations within a culture create sub-cultures of their own, but there is a certain expectation that those will be significantly influenced by the societal traditions.

Societies are complex systems whose elements and characteristics are interrelated. Because of this dense interconnectedness of the system, aspects of the society are influenced by other aspects, and thus some characteristics pertain to more than one aspect. For example, soldier training is influenced by all three aspects addressed in this paper. The culture of a society impacts with and for what he was educated through the civilian academic system as well as the military training institutes to which he was exposed. The infrastructure for sustaining the education and development of the soldier is inextricably linked to the sustainability of the technology the soldier employs. All three aspects directly impact the potential for successful transfer of technology.

Transferring advanced technology to less developed militaries has a plethora of effects each of which may be, depending on the specific situation, desirable or undesirable based on the national strategic objectives. The effects discussed below are not meant to be all-inclusive nor universally applicable. Rather, each effect depicted represents a possible range conditions as a result of transferring technology of which the second and third order effects must be considered at all levels of decision and implementation. In any given situation some effects may be absent while others not presented here may exist. Each situation is unique and requires a holistic approach to determine optimal programs. The aim of this paper is to highlight considerations for this holistic approach.

CAPABILITIES

Capabilities deals with how well-equipped the country and military in question are to provide the requisite support a new technology requires. This includes the industrial infrastructure in place, and how well the infrastructure can provide the logistical lifeline in the way of parts, transportation, and life support for those involved in the transfer and operation of the new equipment. This not only considers the current capacity of the infrastructure, but also the potential to meet the increased demands imposed by the new technology. The discussion to follow outlines some of the considerations for both the host and the sponsor regarding the potential logistical capacity of the recipient.

One of the first considerations is the general nature of the technology being transferred: the characteristics, intent, and expected capabilities desired by the original consumer or designer compared to the characteristics, intent and capabilities desired by the potential host. For example, U.S. equipment and maintenance programs are geared for use under conditions (i.e. environment, operational demands, manner of employment, support architecture) determined appropriate by U.S. decision-makers. Employment, operational demands, environment, etc., of the host nation may be significantly different than the conditions U.S. leaders projected and may result in very different support needs for the same end item. Therefore, sustainment requirements may be greater for the receiving nation causing the host to spend much more time and money to maintain the items than originally expected.

A relationship between the sponsor and host nation is an obvious condition for the transfer to take place, and the effects of the transfer will impact that relationship. Typically, the transfer is only one aspect of a larger security assistance program, thus effects must be considered within the context of the entire program. However, if the transfer is to take place independent of any related activities, the relationship is still of concern for the sponsor and should be closely considered before initiating any such activity. In addition to the first relationship, both parties

must consider their relationships with other countries and international organizations, and how this activity will impact those relationships.¹³

The host nation may assume a feeling of indebtedness to the sponsor nation depending on the details of the arrangement. This feeling could have both positive and negative effects on the relationship in that the recipient may either be appreciative of the assistance, or could feel burdened by the indebtedness. Related to this is the feeling of prestige the recipient may gain from the transaction.¹⁴ The recipient may perceive itself to be in better standing with the sponsor nation than its peers not benefitting from equal attention. Likewise, those other countries may have similar perceptions which will have a variety of potential effects impacting the sponsor's other relationships. Taken further, the sponsor nation's relationship with two antagonist host nations adds further complexity. For example, the U.S. currently provides security assistance to both Pakistan and India, two countries with a history of violence and animosity toward each other.

Another long-term consideration for such activities is the recipient's over-reliance on the sponsor country to support and sustain the new technology. With this new technology comes the need to provide specialized consumable items (fuel, batteries, ammunition). Advanced technology requires advanced repair capabilities and replacement components. Advanced technology also requires highly skilled personnel to maintain and repair. Indigenous operators of the new equipment must be trained, and a sustained training program is necessary to maintain a corps of operators and technicians. In addition to all of these immediate requirements, the consumable items and repair parts must be manufactured, transported, stored and managed. The

¹³ For example, the U.S. must consider the impact of its activities with Middle Eastern countries compared to those with Israel, and vice versa.

¹⁴ Christian Catrina, *Arms Transfers and Dependence* (New York: Taylor and Francis, 1988), 230; Lewis W. Snider, "Arms Transfers and the Diffusion of Power: Implications for Foreign Policy" in *Military Assistance and Foreign Policy*, ed. Craig M. Brandt and Ernest R. Keucher (Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, 1990), 42.

skilled repairpersons and trainers must be sustained, and the corps of operators must have training facilities and training resources, and all of these must have life support. The host may look to the sponsor to provide and subsidize many of these requirements.¹⁵

The Kingdom of Saudi Arabia provides examples of these requirements being fulfilled from outside its borders. At its highest, Saudi Arabia employed 14,000 foreign technicians to sustain its military. It employed 10,000 Pakistani troops to fill gaps in specialty and technical military positions, and employed what author Anthony Cordesman called a “de facto reliance on over-the-horizon reinforcement by the United States and Western allies...”¹⁶

This increased dependence for support binds the sponsor to the host. Though the sponsor may recommend appropriate organizations, doctrine and systems to support and sustain the technology and its associated training requirements, this may exceed the recipient's absorption capability, in which case the sponsor has to take a more active role.¹⁷ This bond implies further second and third order effects for the sponsor. There is a potentially negative psychological effect on the recipient if in the future the sponsor country withdraws or significantly reduces its support before the recipient country is prepared to sustain the technology itself. This leads to accusations and perceptions of abandonment.

Less drastic, but still of concern is a failure of the sponsor nation to meet the agreed support requirements. This predicament can come as a result of several causes: competition with the sponsor nation's own military needs, supply chain shortages and obstacles, and political

¹⁵ The U.S. Military Training Mission (USMTM) to the Kingdom of Saudi Arabia was established in 1953 and continues today. Its charter is to provide advice and assistance with training and organization of the Saudi Arabian Armed Forces. The mission also provides technical assistance in fielding and sustaining the systems transferred to Saudi Arabia from the U.S. United States Military Training Mission to Saudi Arabia, <http://www.usmtm.sppn.af.mil/>, (accessed 28 March, 2008); GlobalSecurity.Org, <http://www.globalsecurity.org/military/agency/dod/usmtm.htm>, (accessed 28 March 2008).

¹⁶ Anthony H. Cordesman, *Saudi Arabia Enters the Twenty-First Century* (Westport, Connecticut: Praeger Publishers, 2003), 52-3.

¹⁷ Ibid, 232.

events that impede the support, to name a few. In a crunch, the recipient country in close coordination with the sponsor may have to cancel one requisition to free funds to pay for another, higher priority requisition. This potentially sets in motion future supply and funding complications that could impair the flow of parts to the recipient.¹⁸ Each or even all of these related issues could eventually harm what was intended to be a valuable relationship between the sponsor and host.

The recipient may also create unfavorable conditions for the sponsor. One example would be the recipient over-extending its resources in an attempt to absorb this technology. An eventual backlash for the sponsor is the notoriety on the international stage that it is selling this expensive, advanced technology to a country that reduced funding of social programs, increased national deficit, or took any number of similar political actions in order to fund this new system at the expense of providing for the basic needs of its people. The sponsor now appears as the unscrupulous swindler encouraging the host to spend money on its products rather than on more important domestic programs. Worse yet would be transfers to a government with a poor human rights record. While children are malnourished and ailments afflict the land, the military has great new gizmos with which to wage war. In cases such as these, the U.S. State Department's Bureau of Democracy, Human Rights and Labor would weigh in to advise on specific security assistance programs with the ill reputed country.¹⁹ Regardless, the sponsor's reputation is potentially at stake, and it must always consider this.

¹⁸ Eric M. Petterson, MAJ, USAF, *Acceleration of Foreign Military Sales Resupply to Third World Nations Involved in Counterinsurgency Operation* (Maxwell Air Base, Alabama: Air University, 1987), 33.

¹⁹ U.S. Department of State, "Human Rights," <http://www.state.gov/g/drl/hr/> (accessed February 24, 2008). Formerly the Bureau of Human Rights and Humanitarian Affairs.

For instance, the U.S. Department of State Country Report on Human Rights Practices-2007 for India indicated that “...numerous serious [human rights] problems remained.”²⁰ Concurrently, according to the World Food Programme (WFP) India contained nearly 50% of the world’s “hungry” as of 2008, and that roughly 35% of India’s population is malnourished.²¹ Meanwhile, the U.S. significantly increased Foreign Military Sales (FMS) to India from approximately \$85M (USD) during the period 1950 to 2001, to \$336M (USD) from 2002 to 2006.²² Situations such as this potentially create unpleasant questions for policymakers.

Another possibility is that the recipient is unable to absorb the new technology into its military, and is now stuck with a very expensive system that it cannot use. In the mid-1980s, Syria received a large number of vehicle-borne rocket launchers, which of course required a large number trucks and drivers. Syria was unable to deploy the new systems for a time until it procured enough trucks and drivers to support the new rocket systems.²³

Counter to the potential negative effects of a country being over-burdened by the requirements to sustain its new technology are the concepts of economic ‘spin-off’ and dual-use technology. Economic spin-off hypothesizes that transfers of military technology have potentially large, positive economic impacts by way of fostering development through increased domestic spending. One source noted that, on average, approximately 40% of the money a host

²⁰ U.S. Department of State, “India- Country Reports in Human Rights Practices- 2007,” <http://www.state.gov/g/drl/rls/hrrpt/2007/100614.htm> (accessed April 5, 2008).

²¹ World Food Programme, “Where We Work-India,” http://www.wfp.org/country_brief/indexcountry.asp?country=356 (accessed April 5, 2008).

²² Department of Defense, Security Cooperation Agency. “Historical Facts Book-2006,” <http://www.dsca.mil/programs/biz-ops/factsbook/FactsBook06.pdf> (accessed April 5, 2008), 3-4.

²³ Stephanie G. Neuman, *Military Assistance in Recent Wars: The Dominance of the Superpowers* (New York: Praeger Publishers, 1986), 74.

spent on new technology goes to the purchase of the actual hardware, while approximately 60% goes to training, construction and support.²⁴

Technology transfers can also have the added effect of encouraging industrial growth by supporting a country's industrial development. Dual-use technology is that which can be used for both military and civilian purposes, such as aviation and communications. The Romanian aviation industry stands as an example of this. Having been involved with the production of military aircraft since the early days of aviation history, their industry adapted to producing both military and civilian aircraft on the same assembly lines. Currently, the Romanian aviation industry is producing several lines and components of military and civilian aircraft in conjunction with and due in part to security assistance programs with the U.S. and other allied partners.²⁵

Both concepts provide potentially positive national and strategic considerations for comparison to some of the potential negative impacts previously discussed. Both concepts also provide the sponsor with a bigger picture and long term considerations when making technology transfer decisions. Military leaders at the operational and tactical levels will have to keep these higher level considerations in mind, but will be more concerned with the more direct impacts of the technology "on the ground".

Of significant concern for the operational and tactical leaders is the potential loss of the technology by the host nation forces to the enemy. An official U.S. estimate of Salvadoran guerillas indicated that roughly half of their arms and 20% of their ammunition was U.S.-supplied

²⁴ Stephanie G. Neuman, "Arms Transfers and Economic Development: Some Research and Policy Issues" in *Arms Transfers in the Modern World*, ed. Stephanie G. Neuman and Robert E. Harkavy (New York: Praeger Publishers, 1980), 227. For a more detailed consideration of the economic effects of military technology transfer, see Neumann's entire chapter, pages 219-245.

²⁵ Drew L. Schumann, MAJ, USAR, "A Transformational Approach to Security Assistance: The Case for Romania" in *Security Assistance: U.S. and International Historical Perspectives*, ed. Kendall D. Gott and Michael G. Brooks (Fort Leavenworth, Kansas: Combat Studies Institute, 2006), 573-4.

items taken from El Salvadoran government forces.²⁶ Accounts from Afghan guerillas from the Soviet-Afghan War indicated that disgruntled or greedy Soviet soldiers and officers were a consistently lucrative source of arms and munitions, and that defecting Afghan officers brought with them not only Soviet equipment, but also the necessary technical training to support it.²⁷ In fact, the situation was deemed so dire that one Soviet military leader ordered the removal of the 12.7mm DShK machine guns from the Afghan army T55s for fear of losing these weapons due to desertion.²⁸

Another consideration is that lesser developed countries may not want the advanced technology. A 1989 publication from the Air University cited that many third world belligerents of the time were opting for less-modernized technology. Too many of the advanced technology systems which they had employed were not performing in conflict to the expectations derived from peacetime exercises, and the higher consumption of ammunition and parts was outstripping their ability to sustain the systems.²⁹ Improper long-term planning, as it relates to forecasting future requirements of employment and sustainment, also led to less-than-optimal performance of these advanced systems.³⁰

Additionally, less developed countries tended to fail in understanding how to appropriately employ modern weapons systems. Part cause, part effect, they neither have nor generate the command and control, logistics, training, maintenance and doctrine to support proper employment of these modern systems. As a result, the addition of modern systems tended to

²⁶ Stephanie G. Neuman, *Military Assistance in Recent Wars: The Dominance of the Superpowers* (New York: Praeger Publishers, 1986), 39.

²⁷ Ibid, 52.

²⁸ Ibid, 81.

²⁹ Lewis W. Snider, "Arms Transfers and the Diffusion of Power: Implications for Foreign Policy" in *Military Assistance and Foreign Policy*, ed. Craig M. Brandt (Wright-Patterson Air Force Base, Ohio: Air University, 1989), 42.

³⁰ Eric M. Petterson, MAJ, USAF, *Acceleration of Foreign Military Sales Resupply to Third World Nations Involved in Counterinsurgency Operation* (Maxwell Air Base, Alabama: Air University, 1987), 30.

retard their military abilities.³¹ These advanced systems turned out to be neither easily integrated into their force structure nor easy to maintain under operational conditions.³²

One example of this failure to develop appropriate doctrine and systems lays in the 1982 Lebanon War. One theory to explain the Israeli victory over Syrian forces is their enhanced organizations, systems and training structures compared to those of the Syrians. Though both sides were relatively similarly equipped, the Israeli military employed more sophisticated doctrine using the relative technology.³³ Israeli forces developed and executed apparently superior operational and logistical plans to support the offense, and effectively coordinated ground, air and naval forces to overwhelm the Syrian defense.³⁴ In short, the Syrian military did not develop sufficient systems and doctrine to effectively counter the Israeli attack.

A country's infrastructure and logistics systems may not be easily adapted to the new requirements imposed by the new technology. What is considered 'routine' maintenance to the sponsor military may overburden a less robust system.³⁵ Currently, U.S. systems are almost entirely digital, posing significant obstacles to hosts lacking the widespread information systems necessary to employ an all-digital network. In these cases, the sponsor would be well-served to assist the host partially or wholly through facilitating analog systems until conditions exist that the host is able to adopt digital systems. It is usually easier in these cases for the sponsor's digital

³¹ Stephanie G. Neuman, *Military Assistance in Recent Wars: The Dominance of the Superpowers* (New York: Praeger Publishers, 1986), 72.

³² Stephanie Neuman "Dependence, Power and Influence: The Role of Military Assistance" in *Military Assistance and Foreign Policy*, ed. Craig M. Brandt (Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, 1990), 10.

³³ Stephanie G. Neuman, *Military Assistance in Recent Wars: The Dominance of the Superpowers* (New York: Praeger Publishers, 1986), 72-3.

³⁴ Trevor N. Dupuy and Paul Martell, *Flawed Victory* (Fairfax, VA: Hero Books, 1986), 141-7.

³⁵ Geoffrey Kemp, "Arms Transfers and the 'Back-end' Problem in Developing Countries" in *Arms Transfers in the Modern World*, ed. Stephanie G. Neuman and Robert E. Harkavy (New York: Praeger Publishers, 1980), 269.

systems to incorporate the host's analog methods rather than the reverse.³⁶ However, it must be noted that as digital systems become the enduring standard in the U.S. military and the 'old-timers' leave service, the military may eventually lose its base of experience in analog systems unless these processes are practiced occasionally. Additionally, analog systems may have an added effect of reinforcing in the minds of the host-nation personnel that handwritten documents are the norm, causing potential resistance to adaptation of digital data, documents and systems.

Beyond simple language barriers, specific technical terms may not resonate equally between the sponsor and host. Along with the sponsor's systems comes the technical jargon that may not be easily understood or accurately translated to a foreign language speaker.³⁷ Availability of technical manuals in the host's native language (or languages!) presents one set of problems, and when third country equipment is present between the host and sponsor, a third language barrier potentially exists.

Finally, host nation acceptance of a system may be impeded by lackluster results from initial employment. Sponsor-nation trainers may also be discouraged at their perceived failure to produce what they deem to be respectable results. In the 1980s, the U.S. supported anti-Soviet rebel fighters (Mujahidin) by various means which included training, material and technology. When SA-7 and ZSU-23 air defense systems were introduced to these Afghan rebels by U.S. sponsors in 1981, the systems were initially ineffective in the hands of the Mujahidin due to improper handling and employment. It was not until mid-1984 when an appreciable effect

³⁶ Eric M. Petterson, MAJ, USAF, *Acceleration of Foreign Military Sales Resupply to Third World Nations Involved in Counterinsurgency Operation* (Maxwell Air Base, Alabama: Air University, 1987), 46.

³⁷ *Ibid*, 57.

attributable to these systems was seen on Soviet air operations.³⁸ In similar cases, technological simplicity turned out to be more important than sophistication. Equipment easily employed and supported worked better for the host than highly effective, but significantly more sophisticated systems.³⁹

FOUNDATIONS

A country's academic institutions have significant impact on the technical proficiency of the population. At the most basic level, the literacy rate for the host country would be a substantial concern when ascertaining the potential for successful technology adoption. One would expect a country with limited education opportunities to be much less acclimated to advanced technological concepts and thus less adaptable to modern technology in terms such as rate of comprehension, application transference, and the capacity to regenerate skilled technicians. Conversely, a country with more widespread education facilities, especially those with comprehensive academic programs that balance studies in technical and humanities fields, would appear to be more likely to quickly adopt and incorporate new technology, as well as sustain the systems and adapt them to more adequately meet that country's needs. Ultimately, the society's academic landscape provides indicators for the potential for technical competency and scholastic conditioning, as well as the military's inclination for educating its personnel. Hence, the educational environment of a country provides a strong indicator to the potential for success for the reception, implementation and sustainment of advanced technology.

³⁸ Stephanie G. Neuman, *Military Assistance in Recent Wars: The Dominance of the Superpowers* (New York: Praeger Publishers, 1986), 83. Even Soviet leaders acknowledged the tactical effect the Stingers had on Soviet air operations, forcing them to change air tactics and reduce reliance on airpower. At a minimum, psychological effects were felt by both the Soviet forces and the rebels. For more discussion on the effects of the Stingers on Soviet operations see: Diego Cordovez and Selig S. Harrison, *Out of Afghanistan: The Inside Story of the Soviet Withdrawal* (Oxford: Oxford University Press, 1995), 198-202; Brigadier Mohammad Yousaf and Major Mark Adkin, *The Bear Trap: Afghanistan's Untold Story* (London: Pen and Sword Books, 1992), ch 11.

³⁹ Ibid, 83.

During the Cold War, the Soviets' primary mode of operation when selling equipment to other countries was to provide the customer with little or no spare parts or maintenance capabilities in the initial deal. Follow-on support was generally limited. This practice stemmed, at least partly, from a Russian military centralized maintenance system. Overhaul and major repairs were done almost strictly in the Soviet Union, even for their own deployed forces. Customers were generally held to the same standard.⁴⁰

Although this idea at first appears to be primarily a sustainability issue, it relates to both education and culture. From an education perspective, this history of not having indigenous maintenance capabilities resulted in the effected organizations neither having commensurate educational facilities and programs to train personnel for maintenance nor a doctrine oriented on facilitating maintenance at operator to lower organization levels. Forces with complex modern systems need a large pool of skilled technicians to maintain and operate these systems.⁴¹ In a limited-skills labor environment, how many technically competent laborers can a force devote to somewhat menial yet technical tasks such as ordering parts?⁴² Under such conditions, sustainment training systems will likely be rudimentary, or even nonexistent.

How does this impact technology transfer? Operators who received the technology would or might be disinclined, based on their traditional habits, to conduct required user-level maintenance. These habits would be reinforced by the organization to which they are assigned. Further, these organizations would not traditionally have the support apparatuses in place to perform mid-level maintenance, and would likely have to create not only the sub-organizations, but the personnel (which may translate to specialized jobs), equipment, procedures and doctrine.

⁴⁰ Ibid, 27.

⁴¹ Christian Catrina, *Arms Transfers and Dependence* (New York: Taylor and Francis, 1988), 229-30.

⁴² Eric M. Petterson, MAJ, USAF, *Acceleration of Foreign Military Sales Resupply to Third World Nations Involved in Counterinsurgency Operations* (Maxwell Air Force Base, Alabama: Air University Press, 1987), 57.

This is no small consideration just to be able to support a piece of equipment with basic technical capabilities. The astute leader can recognize potential difficulties here interfacing with organizations with such traditions.

TRADITIONS

Culture impacts how people interact with one another, among many other things. This personal interaction is a primary focus for this paper, and culture has huge implications for the individual involved with transferring technology to a foreign party. Interaction between students and trainers carries different implications from culture to culture. How open students are to criticism and feedback will directly impact the trainer's methods. Cultural parameters that influence student initiative, feedback and expression can dramatically affect a trainer's ability to effectively educate his students, as well as the resultant proficiency of the students on the required skills. In short, culture may provide barriers to effective learning environments based on contrasts in social norms between the sponsor and host.

In the Pulitzer Prize winning book, Guns, Germs and Steel: The Fates of Human Societies, evolutionary biologist Jared Diamond attempted to uncover why disparities of development exist among the societies of the world. Historically, the development of primitive societies was largely based on geography, and how that geography affected food production. The areas with greater capacities for food production tended toward earlier development of written language, and in turn, earlier development of technology. Diamond concluded his analysis by linking the faster technological development (and therefore technological adaptation) to longer histories of state societies and food production.⁴³ However, he did not contend that technological adaptation always follows these trends. He noted numerous examples of societies that failed to

⁴³ Jared Diamond, *Guns, Germs and Steel: The Fates of Human Societies* (New York: W.W. Norton & Company, 1999), 439.

adopt or adapt, at least initially, a new technology that was either introduced or developed from within.

Among these, he described Japan's early abandonment of firearms in the 16th century. Firearms were introduced there in 1543, and by 1600 their indigenous production had greatly improved gun technology. Shortly thereafter, the government restricted the production and possession of firearms, even for government purposes, causing firearms to nearly vanish from Japan. The samurai controlled government refrained from adopting this new, apparently effective technology because it contrasted with the historic samurai culture. The firearm was denigrated to the point of near extinction, aided in large part to Japan's isolated island geography which severely restricted reintroduction opportunities.⁴⁴

Another example comes from Ancient Native Mexicans and the development of the wheel. It seems they developed wheels and axles for children's toys, but never adapted this technology for labor due to the fact that they possessed no beasts of burden at the time and thus found no benefit for the wheel over human porters.⁴⁵ The culture had no concept of beasts of burden and therefore did not fully develop the wheel.

Lastly, the adoption of the near universally accepted typewriter keyboard format (QWERTY, named for the first six letters on the top row), which was developed in 1873, stands as one more example of a technological solution that was abandoned. This layout dispersed commonly used letters and letter combinations throughout the keyboard in order to overcome a typewriter engineering deficiency of the time. Typewriters of the era with the original engineering design easily jammed when adjacent keys were struck in quick succession, so the QWERTY keyboard was developed to actually slow typing speed down. Later, in 1932, when

⁴⁴ Ibid, 257-258.

⁴⁵ Ibid, 248. Diamond does not specify what is meant by "Ancient Native Mexican", but by virtue of the occurrence it is implied that the society was pre-New World discovery on account of the lack of domesticated beasts of burden.

engineering improvements alleviated the jamming problem, trials with modified keyboards produced significantly faster typing and reduced effort than on the 1873 format. But by then the QWERTY design was already firmly entrenched in the business culture.⁴⁶ In this case, technology initially drove [business] culture, and then the culture [business] drove the technology.

All three of these examples had cultural catalysts that seemingly defied logic on the surface. However, upon deeper understanding of the conditions, one can see the logic which drove the highlighted condition. The following discussion attempts to highlight some of the logics behind potential cultural barriers to technology transfer so leaders may be aware before they are exposed to them. These examples should also encourage leaders to search for deeper understanding when exposed to cultural quandaries.

Social psychologist and author Geert Hofstede stated that culture establishes the pattern of thinking, feeling, and acting, and equated culture to computer programming, calling it the 'mental software' that is programmed by the social environment.⁴⁷ Hofstede theorized that measurable dimensions of national culture among other effects influence how societies as a whole react to technology, relate to authority, deal with uncertainty and novelty, and how individuals relate to society (individualism versus collectivism).⁴⁸ Hofstede attempted to explain actions and tendencies in some cultures based on their cultural dimension scores, and theorized how societies with similar scores would act. Related to the idea of transferring technology, he cited examples of management techniques and training packages which were developed based on cultural assumptions of countries tending towards high individualism scores. He noted that techniques and tools developed based on an individualist outlook would likely be unsuccessful in societies

⁴⁶ Ibid, 248.

⁴⁷ Geert Hofstede and Gert Jan Hofstede, *Cultures and Organizations: Software of the Mind* (New York: McGraw-Hill, 2005), 3-4.

⁴⁸ Ibid, 22-23.

with higher collectivism scores. These cultures tend to avoid individually focused performance counseling and take such criticisms as dishonorable.⁴⁹ In many cultures, the concept of honor and ‘saving face’ significantly impacts working relationships such as student to teacher and worker to supervisor.⁵⁰ With this in mind, U.S. sponsored training specialists might encounter impediments by employing individualist geared training techniques in collectivist settings.

Differing cultural inclinations may impede the adoption and adaptation of technology, at least in the eyes of the sponsor. Cultures that view corruption as simply an element of the nature of doing business may not fully adapt the sponsor’s methods, and thus may obstruct the resources necessary for training, employing and sustaining the new equipment. Some cultures may view the technical knowledge itself as a form of leverage, and trained individuals then become entities of influence. Accounts of U.S.-trained Afghan rebels who were reluctant to train others on the employment of newly-introduced Stinger missiles highlights a potential obstacle if a sponsor intends to employ ‘train-the-trainer’ methods.⁵¹ In short, “knowledge is power” and so those with the knowledge could be resistant to losing that power by divulging it to others, even if it was for the good of the group.

Other cultural factors not readily apparent can result in very different outcomes between the sponsor and the host forces. Though not necessarily an advanced technology, U.S. military Meals-Ready-to-Eat (MRE) provided an example of a more subtle cultural challenge. U.S. MREs were originally designed to complement the digestive system and dietary habits of the U.S.

⁴⁹ Ibid, 102.

⁵⁰ Craig Storti, *Cross-Cultural Dialogues: 74 Brief Encounters with Cultural Difference* (Yarmouth, Maine: Intercultural Press, Inc, 1994), 67-68, 108, 115. Storti compiled 74 vignettes to give examples of various cultural nuances, several of which include the concept of ‘honor’. This concept is weaved into several other vignettes connected to many different cultures, noting that ‘honor’ and ‘face’ are typically of much greater concern than in American culture.

⁵¹ Stephanie Neuman "Dependence, Power and Influence: The Role of Military Assistance" in *Military Assistance and Foreign Policy*, ed. Craig M. Brandt (Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, 1990), 10.

military service-member. An observation in the 1980s of MREs provided to Central American soldiers noted that the MREs proved undesirable and irritable to the Central American soldiers' digestive systems. This resulted in a tactical problem for the El Salvadoran Army fighting an insurgency as their units relied on this subsistence to support their field operations. Without this subsistence in a comparable alternative form, El Salvadoran units rarely conducted extended field operations because the MREs could not sustain the combat units for long durations. Further, in order to conduct extended operations, the units resorted to contracting vendors local to the area of operation to substitute the provisions, thereby compromising operational security by the large local purchase of rations.⁵²

By no means has the previous discussion of concepts and highlights of examples exhausted the list of possible considerations during the process of transferring technology. Nor have all the possible results after the transfer been listed, much less explored. Additionally, numerous benefits may exist in some circumstances which makes the transfer an easier process than might be expected within one's own military organizations. For example, the sheer novelty and status an individual operator feels when issued an advanced technology item might result in wider spread adaption than in organizations accustomed to operating with similar items.⁵³ Regardless, the following case studies are intended to reinforce some of the concepts previously highlighted as materialized examples. By recognizing these examples, leaders should be able to extrapolate possibilities for application in future military operations involving similar variables.

⁵² Eric M. Petterson, MAJ, USAF, "Military Assistance for the 'Little Wars' of the Third World" in *Military Assistance and Foreign Policy*, ed. Craig M. Brandt (Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, 1990), 271.

⁵³ The author recalled from his own experience, and recounted conversations with many leaders throughout the U.S. Army, of U.S. Soldiers' reluctance to use their Night Observation Devices for various reasons. The author suspects that soldiers from organizations with much less access to such items would be much more inclined to use them if for no other reason than the novelty and 'prestige'.

CASE STUDY COMPARISONS

Two case studies will now be examined using the exploratory aspects previously described. Recognizing that individual accounts and observations may be exceptions to the general conditions and practices of an entire military during a given period, and conversely sweeping statements about the entire organization may not reflect the exceptional cases, these observations and statements still retain value for the leader involved in transferring technology to another force. These examples serve to show just a few of the possibilities one might encounter, and, in the process, prepare leaders to recognize potential points of friction, plan for mitigation, and exploit potential points of leverage. By looking at the Vietnamese military of the 1960's and early 1970's one can see a force transitioning from relatively primitive to modern equipment in a comparatively short period, and some of the consequences and impacts associated with the background of the society and how the process unfolded. In the case of the new Iraqi military, one will see a large, relatively modern force which was dismantled then rebuilt (as of the production of this paper, this rebuilding is still in process) in a different image with all the vestiges of the previous organizations to be considered. In both cases, the reader should see impacts of the societal characteristics which might lead to better understanding prior to involvement in the transfer of technology.

VIETNAM

CAPABILITIES

Vietnamization was the U.S. attempt to configure and outfit the Royal Vietnamese Armed Forces (RVNAF)⁵⁴ with the necessary capabilities to defeat the North Vietnamese Army. This resulted in a very large force built around heavy divisions, and heavily reliant on firepower and technology.⁵⁵ The end-state of this plan, once the force was sufficiently built and trained, was an eventual weaning of South Vietnam from U.S. military aid. However, the end of aid came sooner and more abruptly than the RVNAF had anticipated and thus they were not as prepared as they would have liked.⁵⁶ At least two negative effects resulted from this build-up of equipment with a relatively abrupt end. First was a psychological impact on the Vietnamese leadership, both civilian and military, when their benefactor withdrew material support. The diminishment and withdrawal of U.S. aid indicated to the Vietnamese leadership that America was abandoning them.⁵⁷ Second, U.S. advisors had been training their counterparts to count on and manage a system without budgetary constraints. With the end of U.S. aid, this was no longer the reality. The RVNAF no longer had the pipeline of U.S. equipment and money to support its efforts. Based on its reliance on this support, the RVNAF could not suddenly change the doctrine it had

⁵⁴ It is important to note that this case study does not center on any particular element of the South Vietnamese military and security forces. For this reason, the reference to the RVNAF is intentional as it is implying a general statement about two or more elements of the South Vietnamese forces. Any subsequent references to particular elements of the RVNAF, such as the Army of the Republic of Vietnam (ARVN), are meant to make a statement about that specific organization.

⁵⁵ James H. Willbanks, *Abandoning Vietnam: How America Left and South Vietnam Lost Its War* (Lawrence, KS: University Press of Kansas, 2004), 279.

⁵⁶ Ibid, 278-9. It is debatable whether the RVNAF would have ever been amenable to a cessation of U.S. support.

⁵⁷ Arnold R. Isaacs, *Without Honor: Defeat in Vietnam and Cambodia* (Baltimore: The Johns Hopkins University Press, 1983), 502.

been using.⁵⁸ In the sentiment of one Vietnamese staff officer, the RVNAF had to learn to fight a ‘rich man’s war’ on a ‘poor man’s budget’.⁵⁹

By 1972, the U.S. Military Assistance Command-Vietnam’s (MACV) logistics advisors had assisted with the establishment of a National Materiel Management Agency, and the completion of a depot upgrade program. MACV estimated that the revised logistics system would be capable of adequately supporting the combat arms by 1973, although some assistance by U.S. civilian employees and outside contractors with more complex equipment would still be required.⁶⁰ However, assuming the South Vietnamese military could develop sufficient systems and organizations as predicted, the primary source of the equipment was the U.S. This condition equated an almost total reliance on the U.S. military industrial complex to provide material requirements to sustain the force. Even with well-functioning support organizations in place, this would result in significant supply constraints for operational and tactical leaders because their systems were not domestically produced and thus subject to fluctuations associated with elongated supply chains.⁶¹ Relatively small glitches with the U.S. manufactures and the transportation systems that connected them to South Vietnam would have major impacts on South Vietnamese operations, especially if these issues coincided with a period of increased demand. This understanding of the general supply chain for the technology is important for operational and tactical leaders to recognize when they are involved in such partnered operations.

⁵⁸ Ibid, 285.

⁵⁹ Ibid, 319.

⁶⁰ Jeffrey J. Clarke, *United States Army in Vietnam-Advice and Support: The Final Years, 1965-1973* (Washington, D.C.: Center for Military History, 1988), 453.

⁶¹ During his military career, the author occasionally experienced supply chain delays from the domestic manufacturers when assigned to units within the continental United States under peacetime conditions. If manufacturing and distribution issues were felt at the operator level with much shorter depot-to-user lines, then it stands to reason that consumers with exponentially longer supply lines would tend to experience greater impacts due to manufacturing and distribution anomalies.

In summary of Vietnam's capabilities, it appears that it did not have the infrastructure necessary to support the level of technology transferred from the U.S. Additionally, even with significant sustainment support provided by the U.S., Vietnam lacked the capabilities to assume sustainment of the transferred technology without a continued life-line to the U.S. military industrial complex. Finally, to develop self-sufficient sustainment capabilities, especially for sustained combat, appears to have been unlikely for many years. All of these indicate Vietnam's reliance on a significant and enduring U.S. support program to overcome the shortcomings in the Vietnamese capabilities to sustain their new technology.

FOUNDATIONS

Prior to French colonization, Confucianism was the central force in Vietnamese education, emphasizing moral character, wisdom, history, and Confucian classics. Historically, education was valued in Vietnamese society as the primary means to rise above poverty. In Confucian society therefore, scholars were at the top of the hierarchy of respect and admiration. Education led to the opportunity for admittance into the national bureaucracy by way of passing the national exams.⁶² During the late nineteenth and early twentieth centuries, Vietnam underwent numerous changes based on its French colony status, one of which was reform to public education. The French-introduced Western-style education which sparked cultural contention as the students faced disparities between home and school. At home, students were confronted with traditional values espousing family group oriented views while at school they were exposed to Westernized views of individualism and modernity. Although the French did establish a centralized education system based on their Westernized approach, they did not encourage widespread education of the masses. It seems that their primary motive for

⁶² L. Shelton Woods, *Vietnam: A Global Studies Handbook* (Santa Barbara, California: ABC-CLIO, 2002), 129-133.

establishing the Westernized system was to develop colonial civil servants.⁶³ Those Vietnamese who were fortunate enough to enter into the French education system tasted the opportunities of modernity and economic success that their education provided. Furthermore, those who were not so fortunate eventually came to recognize the opportunities a Western education provided. This resulted in grassroots movements toward education reform within the Vietnamese society in an effort to further develop the Vietnamese education system to replicate the perceived successes of Western society.⁶⁴ As a result, Viet Minh leadership, during their war for independence from the French, considered education an imperative for indoctrination into the Communist ideology.⁶⁵ The Vietnamese attributed the material and economic accomplishments of Western societies to the Western education systems, as well as culture, which emphasized more technical studies than the traditional Confucian education. This motivated leaders in Vietnamese urban centers in the early 1930's to modernize, replacing old values with Westernized views and pursuits.⁶⁶ One prolific author travelling about Vietnam in the 1950's described a "strong desire for education," and noted that even the elderly in Hanoi gathered during the day to study reading and writing.⁶⁷ He marveled at the advanced studies of medicine, pharmacy and law in Hanoi, and was amazed at the mathematical abilities of students in Saigon.⁶⁸

The emphasis on education translated to a stratification of the Vietnamese military. As of 1965, the draft and recruiting were education based, with the enlisted ranks comprised of men with less than seven years' education, noncommissioned officers having an equivalent of a junior

⁶³ Ronald J. Cima, ed., *Vietnam: A Country Study* (Washington, D.C.: U.S. Government Printing Office, 1989), 129.

⁶⁴ Harvey H. Smith, et al., *North Vietnam: A Country Study* (Washington, D.C.: U.S. Government Printing Office, 1982), 139-40.

⁶⁵ *Ibid*, 140.

⁶⁶ Neil L. Jamieson, *Understanding Vietnam* (Berkeley: University of California Press, 1993), 107.

⁶⁷ Bernard Newman, *Report on Indo-China* (London: Robert Hale Limited, 1953), 97.

⁶⁸ *Ibid*, 98.

high education, and officer candidates requiring baccalaureates.⁶⁹ In December 1966, the Vietnamese Military Academy was converted from a two-year to a four-year program, modeled after West Point. The new curriculum emphasized various engineering fields and social sciences.⁷⁰

Aside from language barriers between American instructors and Vietnamese students, research indicates that Vietnamese military personnel were generally able students, even in technically advanced fields. One account described the success of training such sophisticated concepts as microwaves, tropospheric scatter radio and other electronics and communications concepts.⁷¹ Regarding language barriers, one observer noted that certain terms lost their technical specificity in translation.⁷²

Accounts of pilot and aviation mechanic training generally indicate successful completion of U.S.-sponsored training. In many instances, trained Vietnamese even piloted American aircraft in American units as a part of their training culmination.⁷³ By the end of Vietnamization, Saigon manned one of the largest and most modern air forces in the world, no minor accomplishment based on its history.⁷⁴ One could logically conclude that a strong educational foundation significantly contributed to these training successes.

⁶⁹ Jeffrey J. Clarke, *United States Army in Vietnam-Advice and Support: The Final Years, 1965-1973* (Washington, D.C.: Center for Military History, 1988), 40.

⁷⁰ James Lawton Collins, Jr, Brigadier General, USA, *Vietnam Studies: The Development and Training of the South Vietnamese Army, 1950-1972* (Washington, D.C.: Department of the Army, 2002), 80.

⁷¹ *Ibid*, 111.

⁷² *Ibid*, 116.

⁷³ James Lawton Collins, Jr, Brigadier General, USA, *Vietnam Studies: The Development and Training of the South Vietnamese Army, 1950-1972* (Washington, D.C.: Department of the Army, 2002), 113-4; Jeffrey J. Clarke, *United States Army in Vietnam-Advice and Support: The Final Years, 1965-1973* (Washington, D.C.: Center for Military History, 1988), 443.

⁷⁴ Jeffrey J. Clarke, *United States Army in Vietnam-Advice and Support: The Final Years, 1965-1973* (Washington, D.C.: Center for Military History, 1988), 461.

In summary, it appears that the Vietnamese education foundation adequately prepared its service-members to adopt technology. Vietnamese service-members grasped technical concepts and sophisticated topics, and were able to implement their training in combat. However, the language barrier was always a consideration.

TRADITIONS

Although Vietnam reformed its education system based on Western influences, some elements of the traditional Vietnamese culture remained to some extent as the country attempted to modernize. Confucianism stressed family loyalty and solidarity, veneration of ancestors and filial piety. Ancestral reverence was of such importance that it was believed that the souls of dead ancestors controlled the individual's fate, implying a certain level of fatalism in the culture.⁷⁵ At least one affect of this family-centric orientation was manning of ground forces.

As of 1965, voluntary enlistments satisfied over half of the personnel requirements for the RVNAF. Some of the primary motivations for enlistment included the lure of adventure, prestige and a certain amount of independence as opposed to the mundane agricultural lifestyle of the rural Vietnamese. Often, the individual's commitment to the unit was based on geography, with the common practice of units remaining regionally stagnant, allowing soldiers to maintain close family contact and support during their service. However, significant desertions occurred whenever units were relocated. It was not uncommon for soldiers to proffer bribes or other arrangements with local commanders to excuse their military service, or for assignment to stationary units such as the Popular Forces.⁷⁶

⁷⁵ Ronald J. Cima, ed., *Vietnam: A Country Study* (Washington, D.C.: U.S. Government Printing Office , 1989), 128.

⁷⁶ Jeffrey J. Clarke, *United States Army in Vietnam-Advice and Support: The Final Years, 1965-1973* (Washington, D.C.: Center for Military History, 1988), 159, 42.

There were however somewhat positive effects of the family-centric focus.⁷⁷ Oftentimes Vietnamese soldiers' families lived nearby or on the military camp. This afforded more protection for these families from the Viet Cong, provided opportunities for family members to earn extra money by providing services to the camp and encouraged the soldiers to fight harder against attack since they were in actuality defending their families.⁷⁸ Complicating the morale conditions was the leadership culture of the organizations. U.S. military advisors generally considered Vietnamese junior officers and noncommissioned officers potentially competent, but lacking in motivation. Based on the recruiting and draft system, these leaders all possessed minimum civilian education based on the prerequisites of the positions. However, they showed little concern for their men and typically failed to accept responsibility.⁷⁹

Further, promotions and key assignments tended to be based more on political alliance rather than military prowess.⁸⁰ As of 1968, Saigon was still centrally controlling key military appointments based on the elitist system, rather than performance. Widespread corruption and exclusion of almost all potential officer candidates who had not passed through the preferred education system reinforced a self-perpetuating system that could not adapt to a military environment in need of strong leadership based on merit as opposed to elitism.⁸¹

Two characteristics likely reinforced by the centralization of power were lack of initiative and a lack of training focus. One observer noted that a significant portion of the Vietnamese senior military leadership came from societal upper-class. He observed that this group lacked

⁷⁷ Evaluating these examples as "positive" depends on the perspective of the observer. Some might consider the examples as further burden to operations and causal factors to some of the previously identified desertion problems.

⁷⁸ Jeffrey J. Clarke, *United States Army in Vietnam-Advice and Support: The Final Years, 1965-1973* (Washington, D.C.: Center for Military History, 1988), 44.

⁷⁹ Ibid, 159.

⁸⁰ Ibid, 47.

⁸¹ Ibid, 336.

aggressiveness and commitment to the profession. This attitude of senior leaders pervaded down through the non-commissioned officer ranks as well.⁸² As for initiative, Offensive operations of regular infantry units often took the form of one-day sweeps that proved ineffective. Regularly scheduled training periods for combat units were treated as recovery and rest opportunities by Vietnamese commanders, significantly detracting from the potential for improving unit performance.⁸³ Vietnamese commanders generally considered field training valueless, insisting that real combat experience was the preferred training method.⁸⁴ These attitudes were attributed primarily to war weariness, but also to the elitist government system that perpetuated and promoted individuals based on their aristocratic status rather than performance.⁸⁵

These conditions within the RVNAF created sub-cultures of their own, but were still impacted by the society at large. For example, an economic down-turn in Vietnam in the early 1970's affected military performance in the ARVN. In 1973, Vietnamese soldiers were being paid less than the estimated cost of food, so theft and corruption became activities of survival.⁸⁶ Thus, cultural effects on the military included both limitations, and potential advantages, tied to the family-centric outlook. The military culture of centralization of authority and nepotism detracted from its performance. Finally, economic conditions within the country contributed to a military culture that accepted corruption, which in turn negatively impacted operational performance.

⁸² Ibid, 162-3.

⁸³ Ibid, 161.

⁸⁴ Ibid, 162.

⁸⁵ Ibid, 163.

⁸⁶ Arnold R. Isaacs, *Without Honor: Defeat in Vietnam and Cambodia* (Baltimore: The Johns Hopkins University Press, 1983), 301. As an example, the author noted that a Vietnamese sergeant with 14 years' service made about \$25 USD per month, and food was estimated to cost an average of about \$23 USD per month.

CONCLUSIONS

The Vietnam case study highlighted issues related to capabilities, foundations and traditions. Without significant U.S. support, the Vietnamese infrastructure lacked the ability to provide for its own development and maintenance of the requisite materiel to replace what was lost when the U.S. halted support. On the other hand academic foundations of the country appeared to sufficiently support incorporation of advanced technology in the military; however numerous national and military cultural characteristics tended to detract from the Vietnamese military's ability to appropriately sustain and use the technology available.

IRAQ

CAPABILITIES

Sustainability of the post-Saddam Iraqi military has been an issue from inception. A significant portion of the Iraqi military's equipment during the Saddam era was of Soviet origin, and thus likely units displayed many of the characteristics of Soviet-sponsored assistance described earlier. U.S. military leaders working with Iraqi soldiers noted a lack of operator maintenance skills, and reported that typically only unit mechanics performed maintenance, scheduled or unscheduled.⁸⁷ In one Iraqi unit, the lead mechanic was incarcerated in the unit detention facility on more than one occasion for failing to maintain the fleet to the Iraqi unit commander's requirements. This particular mechanic had little to no maintenance manuals for the fleet and had no prior maintenance management experience. He had only a small collection of basic tools and the few personnel working for him had very little or no technical training prior to arriving in the unit. He obtained parts through cannibalization (taking parts from one

⁸⁷ Angelito L. Gutierrez, Lieutenant Colonel, USARNG, interviewed by author, in person, Fort Riley, KS, December 13, 2007.

inoperable piece of equipment to repair another) within the fleet, or through locally purchasing parts from the civilian economy apparently with personal funds.⁸⁸

One specific example from this Iraqi unit of the inadequate support structure was the issue of providing replacement brake pads for the U.S.-provided M1114 up-armored HMMWVs. The Iraqi supply system was unable to provide sufficient stocks of brake pads, so Iraqi soldiers contracted local civilian vendors to fabricate replacements. Although the U.S. advisor did not recall any major vehicle incident which could be attributed to these potentially substandard parts, he did recount that the locally manufactured brake pads were not tested to ensure they met the required specifications for use on these vehicles. Additionally, the advisor could only speculate on how these parts were funded, noting that he was sure they were not funded by official unit resources.⁸⁹

Advisors also noted sustainability issues due to sponsor-related issues. Some Iraqi units received U.S.-provided Harris⁹⁰ radios through the Ministry of Defense, but neither U.S. nor Iraqi units had the support systems in place to support these new items.⁹¹ Oftentimes, U.S. advisors had little or no training on the systems and so they were of little assistance in operating and maintaining them. Similarly, Iraqi units were outfitted with Toyota trucks, but the support system was immature and mechanics and soldiers had to buy parts out of pocket on the local economy.⁹² This practice tended to diminish fleet readiness, as well as have some negative effects on soldier morale. A similar example was noted where a shipping container filled with Hyundai parts was

⁸⁸ Jeffrey Coberly, Captain, USA, interviewed by author, telephonic and email, Fort Riley Kansas, December 13, 2007 through January 4, 2008.

⁸⁹ Ibid.

⁹⁰ Interviewees referred generically to communications systems marketed by the Harris Corporation.
<http://www.rfcomm.harris.com/>

⁹¹ Angelito L. Gutierrez, Lieutenant Colonel, USARNG, interviewed by author, in person, Fort Riley, KS, December 13, 2007.

⁹² Rob Goodroe, Major, USA, interviewed by author, in person, Fort Riley, KS, December 13, 2007.

discovered on an Iraqi military camp. Unfortunately for that unit, they only possessed Nissan trucks. Investigation revealed that all of the battalions in that division had received shipping containers of spare parts for their civilian-type vehicles months earlier, but apparently due care was not exercised to ensure the appropriate containers were distributed to units with the respective vehicles. As of the observer's departure from Iraq, neither the suspected shipping container of Nissan parts, nor the Iraqi unit with an organization of Hyundai trucks were ever located.⁹³

During the reconstitution of Iraqi security forces, numerous countries provided equipment from a variety of manufacturers, providing yet another set of sustainment issues. With differing sources of manufacture came accompanying technical manuals in potentially foreign languages, unfamiliarity with operation, differing sources of repair parts and services, and compatibility and integration friction.⁹⁴

In summary, Iraqi capabilities tended to detract from the military capacity to support advanced technology. The military history of Soviet-styled maintenance doctrine seems to have rendered the society and military inadequate to provide the personnel and experience to sustain the technology. Further, Iraqi sustainment training required significant improvement and support to sufficiently sustain the force. Finally, such detractors such as inadequate funding procedures, a variety of equipment numerous manufacturer sources, and shortage of adequate training personnel further exacerbated Iraq's limited sustainment capability.

⁹³ Jeffrey Coberly, Captain, USA, interviewed by author, telephonic and email, Fort Riley Kansas, December 13, 2007 through January 4, 2008.

⁹⁴ Certain elements of this statement were specified and/or implied by all of the following interviewed observers: Michael Landers, Lieutenant Colonel, USA, Fort Riley, KS, December 13, 2007; Jeffrey Coberly, Captain, USA, email and telephonic interview, January 4, 2008; Will Arnold, Major, USA, interviewed in person, Fort Leavenworth, KS, January 5, 2008.

FOUNDATIONS

The customary Arab education systems emphasized rote memorization of facts, and regurgitation of lecture and text.⁹⁵ Additionally, instruction focused on religion and Arab history, with significantly less emphasis on science, math and technical topics.⁹⁶ A 1983 study compilation stated that the Iraqi education system dictated 111 periods of instruction on Arabic out of a total of 307.⁹⁷ This prescriptive form of education translated to the Arab military education and operational culture as well.

Individual and collective training tended to be conducted in the same rote manner. Individual training was very narrowly focused on the specific job duties and cross-training was apparently discouraged. Collectively, exercises and drills tended to be very scripted, and evaluations were based on degree of adherence to the script rather than oriented on results. This scripted performance was so emphasized that proper execution of the task steps was of greater concern than actually achieving the goal the task was meant to accomplish.⁹⁸ Both civilian and military education systems experienced attempts at reform, but both firmly resisted.⁹⁹ Further, these traditional and scripted methods tended to discourage initiative and reinforce conformity.¹⁰⁰ In the case of the Iraqi education system, Saddam Hussein actually attempted to make improvements. He started several public universities and institutes, encouraged the education of women and diminished the role of religion in universities. However, this emphasis eventually

⁹⁵ Kenneth M. Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (Massachusetts Institute of Technology, 1996), 597-8.

⁹⁶ Ibid, 601-5.

⁹⁷ Byron G. Massialas and Samir Ahmed Jarrar, *Education in the Arab World* (New York: Praeger Publishers, 1983), 80. The study noted the following consolidated curriculum requirements for Iraqi primary, intermediate and secondary students (in academic periods): Arabic, 111; Math, 69; Foreign Language, 57; Geography, 27; Science, 22; Islamic Studies, 21.

⁹⁸ Kenneth M. Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (Massachusetts Institute of Technology, 1996), 607-9.

⁹⁹ Ibid, 606, 611.

¹⁰⁰ Ibid, 597-8.

met with a lack of both material and intellectual support. Academic contact outside the Arab world was virtually non-existent and educational resources such as medical training supplies, chemicals and books were found to be in severely short supply after the Coalition invasion.¹⁰¹ It was also apparently common practice under the Saddam regime to appoint key university personnel based on their party affiliation rather than their education (some did not have degrees at all). In fact, one account from the interpreter of an American official in the Coalition Provisional Authority recounted that when he was a university student, one of its deans took the paper he wrote and published it under his (the dean's) name.¹⁰² Conditions such as these would tend to contradict quality academic pursuits, as well as dissuade academic initiative and excellence.

Of the U.S. advisors interviewed, none recalled having maintenance personnel with previous experience in the Saddam-era military although many had previous experience under the compulsory service obligations of the period. Additionally, the author was unable to find definitive information regarding the level and emphasis on operator and small unit level maintenance. Lastly, post-invasion interviews of Iraqi military leadership provided consistent themes of units in deep disrepair across the services.¹⁰³ In fact, United Nations sanctions on the Iraqi military since Operation Desert Storm resulted in the near cessation of external supplies of major weapon systems and related parts. Iraq was only able to internally generate small arms and ammunition, never succeeding in generating advanced technology systems of its own. Remaining

¹⁰¹ John Agresto, *Mugged by Reality: The Liberation of Iraq and the Failure of Good Intentions* (New York: Encounter Books, 2007), 75-6. The author noted these and other examples were obviously pre-invasion conditions, rather than due to the war itself.

¹⁰² Ibid, 82. The interpreter indicated that the practice of stolen works was commonplace in Iraq in the Saddam era.

¹⁰³ Kevin M. Woods, *Iraqi Perspectives Project: A View of Operation Iraqi Freedom from Saddam's Senior Leadership* (Joint Center for Operational Analysis, 2006). Accounts from leaders throughout the book indicate steady decline in maintenance rates up to the Coalition invasion, although specific discussions of why were not detailed. Two primary reasons appear plausible: lack of parts and lack of technicians. Either reason reinforces the theme of the theory that Iraqi military organizations lacked the ability to consistently perform the required maintenance, and by virtue of this inability would over time tend to lose the potential and propensity to conduct required maintenance.

weapon systems were obsolete and dilapidated at least partially due to the lack of repair parts.¹⁰⁴

One study concluded that the traditional Arab education system, both civilian and military, and reinforced by Arab culture, was the primary factor contributing to the limited military effectiveness of Arab militaries between 1945 and 1991. The academic atmospheres compounded cultural behavior patterns that resulted in limited military effectiveness.¹⁰⁵

In summary, Iraqi foundations tended to undermine the development in its people of the skills necessary to support advanced technology. The primary education systems tended to lack balanced attention to scientific concepts, and provided limited opportunities for vocational training. When translated to military training, the constrained educational patterns retarded military initiative and excellence of performance. Finally, related to previously discussed capabilities, the existing skills necessary to provide the support and sustainment training for advanced technology also fell short.

TRADITIONS

A 1996 study of Arab militaries and their performance in combat explored the potential influence of culture on military proficiency in an attempt to distill why Arab militaries performed rather poorly in modern battles from 1945 to 1991.¹⁰⁶ The researcher investigated common elements of the Arab culture, some of which one can correlate to the ability to adopt and sustain new technology. Some areas of interest for the purposes of this paper are: conformity and creativity, centralization of authority, deference to authority, manipulation of information,

¹⁰⁴ Anthony H. Cordesman, *Saudi Arabia Enters the Twenty-First Century* (Westport, Connecticut: Praeger Publishers, 2003), 23-4.

¹⁰⁵ Kenneth M. Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (Massachusetts Institute of Technology, 1996), 759. The author also noted that certain behavior patterns characteristic of the dominant Arab culture did enhance a certain level of military effectiveness to some degree. Some of these characteristics included strict obedience, personal sacrifice and group loyalty.

¹⁰⁶ Ibid, 22-23.

atomization of knowledge, and aversion to manual labor and technical work.¹⁰⁷ The researcher also identified group loyalty, as well as personal courage, as characteristics of Arab culture, but no direct correlations appear within the work that suggests any particular impact of these characteristics on the potential for adopting technology.

The study found that the pressure to conform, a cultural inclination, stifled originality, innovation and creativity.¹⁰⁸ This tendency translates to a possible hesitancy to adopt new doctrine based on a new technology, and an inclination to employ the new technology in the same manner as an older system regardless if the employment considerations are different. Centralization of authority had similar effects as conformity in that initiative is stifled. Further, innovation and risk were discouraged in an environment that fostered subservience, and referring of decisions back to higher authorities.¹⁰⁹ This characteristic reinforces a possible hesitation to adopt new technology and appropriately adapt it and its related doctrine to the environment. The characteristic of deference to authority is closely linked to the former two, and especially reinforces a lack of initiative.¹¹⁰

The centralization of authority was highly evident in the Iraqi military, and was highlighted in a post-invasion study titled Iraqi Perspectives Project: A View of Operations Iraqi Freedom from Saddam's Senior Leadership. Senior Iraqi military leaders recounted how compartmentalized Saddam's directives were. In developing and executing his plan for the defense of Baghdad, he forbade coordination between units, fearing that coordination might lead to synchronization of a coup against him. This fear of senior leader coordination went so far as to cause senior leaders to refrain from meeting even socially for fear of risking allegations of

¹⁰⁷ Ibid, 48.

¹⁰⁸ Ibid 48-51.

¹⁰⁹ Ibid, 54.

¹¹⁰ Ibid, 56.

conspiracy. Saddam restricted the distribution of maps even among his elite forces. Even in peacetime, simple decisions of relocating even smaller units required bureaucratic approval reaching all the way to Saddam himself.¹¹¹ An environment such as this likely transcends the force (even the society), encouraging most members to refrain from noticeable exploits of initiative.

The effects of this centralization of authority, which in turn discourages individual initiative, could have significant impact on technology transfer. With a history of such restrictions one would expect hesitation on the part of operators to display initiative in conducting required maintenance unless specifically told to do so. This environment would also discourage individual excellence in performance for fear of being singled out as a potential threat to authority. And for this same reason, innovation in the adaptation of technology to the needs of the organization might also be stifled.

The concept of information manipulation may appear as a moral condition and detestable as a cultural practice, but put in context of the social norms, one might find acceptable logic in such practices. In this culture, shame and honor of the group is of greater consequence than the individual's, and by extension, of greater consequence than 'truth'. Further, an unwelcome 'truth' may be disruptive and thus bad for the group, so compartmentalizing and manipulating the truth becomes a means to an end. Within this means is a commonly referenced practice of saying 'yes' when one really means 'no'. One manifestation of this practice would be the responsible person answering that a task has been completed, or will be completed, when in actuality that is not the case. One author who spent time under Ambassador Bremer, advising the Iraqi Ministry of Higher Education and Scientific Research, noted that Iraqis usually told him the 'truth' but rarely

¹¹¹ Kevin M. Woods, Iraqi Perspectives Project: A View of Operation Iraqi Freedom from Saddam's Senior Leadership (Joint Center for Operational Analysis, 2006), 27-8.

told him the ‘facts’.¹¹² If one considers this type of behavior as acceptable, then embellishment of the truth becomes easier.

This behavior was reinforced in the Iraqi military in an era when telling an unpleasant truth might have had severe consequences to one’s career and health. Several Iraqi generals recounted the common practice of providing rosy reports on such things as status of units, results of tests and outcomes of battles. They cited numerous examples of Saddam rejecting bad news as weakness on the part of the presenter. Upon recognizing the consequences of candor, many leaders ensured all of their reports were overly positive, regardless of the real conditions. The former Director General of the Republican Guard General Staff cited an event in December 2002, months prior to the Coalition invasion of Iraq, in which Saddam’s personal secretary directed the leaders to “make him [Saddam] happy” with their reports, to which they complied.¹¹³ One can see that a culturally accepted practice of manipulating the truth could severely jeopardize proper maintenance, training and operations of any organization, let alone successful transference of new technology.

Another manifestation of this practice may be the transfer of blame to outside parties or forces.¹¹⁴ This type of behavior would obviously create concerns during training on new equipment when instructors are ascertaining the students’ comprehension of the instruction. One might also be concerned with the end user’s understanding of proper employment conditions and considerations. Finally, and most frequently, one would be concerned whether the equipment was *really* receiving the appropriate maintenance and services required.

¹¹² John Agresto, *Mugged by Reality: The Liberation of Iraq and the Failure of Good Intentions* (New York: Encounter Books, 2007), 43. The author distinguished ‘truth’ as the underlying theme of the message, as opposed to ‘facts’ which were the exaggerations and manipulations based on the perspective of the speaker.

¹¹³ Kevin M. Woods, Iraqi Perspectives Project: A View of Operation Iraqi Freedom from Saddam’s Senior Leadership (Joint Center for Operational Analysis, 2006), 8-9.

¹¹⁴ Kenneth M. Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (Massachusetts Institute of Technology, 1996), 58-59.

The study used the phrase 'atomization of knowledge' to describe a manner of thinking in which discreet details are recognized, but without integrating these details into a composite thought. This produced stronger academic performance with rote memorization topics, but weaker performance in interdisciplinary topics. Cited in the study is the result of a report on the performance of Arab and American students in which the Arab students outperformed the American students in vocabulary tests, but underperformed on analogy-based tests.¹¹⁵ The researcher later concluded that Arab education systems in general had significant impact on military effectiveness.

To allege that an entire culture is 'lazy' is not the intent of this author, nor the scholars who observed a tendency of aversion to manual labor and technical work.¹¹⁶ Arab society is dominated by its historical ties to the Bedouin lifestyle, and thus aspects of this heritage, have manifested in the contemporary culture. This aversion traces back to the nomadic lifestyle that, while inarguably tough, disdained common laborer activities such as manual or rural work forms. This feeling has adapted to contemporary labor by adding technical and vocational trades to the list of dishonorable activities. As a result, researchers have noted a shortage in Arab society of skilled labor and technical professionals.¹¹⁷ This labor pool shortage presents considerations for the transfer of technology by raising questions of maintenance and sustainment capabilities within a host country exhibiting similar cultural characteristics. This shortage of technical skill also calls into question the long-term sustainability of a newly introduced technology.

¹¹⁵ Ibid, 60-61.

¹¹⁶ Byron G. Massialas and Samir Ahmed Jarrar, *Education in the Arab World* (New York: Praeger Publishers, 1983), 343. These authors declared that aversion to manual labor is not peculiar to the Arab culture, but rather is apparent in 'capital-rich' societies where students compare the economic disparities between vocational pursuits and more professional fields.

¹¹⁷ Kenneth M. Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (Massachusetts Institute of Technology, 1996), 62-64; Byron G. Massialas and Samir Ahmed Jarrar, *Education in the Arab World* (New York: Praeger Publishers, 1983), 342-4; Fahim I. Qubain, *Education and Science in the Arab World* (Baltimore: The Johns Hopkins Press, 1966), 25.

Specific cultural issues within Iraq have hampered the development of the military in post-invasion reconstruction. U.S. military advisors noted it was not uncommon for older officers to be too proud to admit their lack of technological knowledge, and simultaneously display an unwillingness to learn. The examples cited were primarily related to computer systems but could logically extend to any piece of mechanical equipment. For these leaders, appearing less proficient than their subordinates at a task threatened their power base, and so they were inclined to marginalize the employment of technologies that they did not understand.¹¹⁸

Another potential friction point is societal divisions within the organization. Kurdish military leaders were extremely reluctant to send their soldiers outside the Kurdish area to the training institutes in Baghdad for fear that the soldiers would either be harmed or improperly trained due to the ethnic tensions.¹¹⁹ This and other strong cultural divides have surfaced within the Iraqi military and have been an obstacle on more than one occasion.

Several U.S. military leaders also noted the proclivity for Iraqis to prefer handwritten over electronically-produced documents. Further, electronic media was often not considered official because it did not have a signature or an official stamp. One American military advisor recounted a condition under which the higher command of the Iraqi unit he was advising would not accept electronically generated requests. Instead, the higher headquarters required the unit to send original documents by courier. Considering the travelling distance and dangerous environment, the advisor developed a relationship with another American advisor at the higher headquarters. When such a request was created, the first advisor would scan and email the

¹¹⁸ Angelito L. Gutierrez, Lieutenant Colonel, USARNG, interviewed by author, in person, Fort Riley, KS, December 13, 2007.

¹¹⁹ Ibid. During LTC Gutierrez' tenure in northern Iraq, all of the centralized training of technical skills for the Iraqi Army was located in and around Baghdad.

original version to his counterpart, whereupon the ‘original’ document would then be presented to and accepted by the command.¹²⁰

Most previously noted examples related to Arab military performance indicated poor performances and behaviors by these organizations. As caveats to the less-than-flattering statements about Arab militaries are examples of exceptional military performance. Though the subject of Arab military successes is outside the scope of this research, some examples are noteworthy for recognition of the fact that the general statements made here are not universally applicable as absolutes.

Cited in one study were organizations such as Jordan’s Arab Legion, the Syrian Commandos, the Royal Saudi Air Force F15 pilots during the Gulf War, and the Iraqi Republican Guard. The study found that these highly effective units actually countered the dominant cultural trends through establishing small, highly exclusive units that could effectively ‘train out’ the undesirable cultural habits.¹²¹ The study further declared that the more effective organizations which were not necessarily considered ‘elite’ were able to overcome adversities of the dominant culture by developing a different military culture.¹²² The roots of these organizations adopting separate cultures that diverged from the societies at large often traced back to charters of Western influence during colonial periods.¹²³

CONCLUSIONS

Traditions in the Iraqi culture negatively impacted the military ability to operate and sustain advanced technology. Individual outlooks on such issues as deference to authority, group

¹²⁰ Ibid.

¹²¹ Kenneth M. Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (Massachusetts Institute of Technology, 1996), 627.

¹²² Ibid, 629.

¹²³ Ibid, 625, 631.

loyalty and personal honor indicate potential barriers to training and maintenance of sophisticated systems. Requirements for proper respect, historical reverence for the nomadic lifestyle, and habits formed under a suspicious ruler further impeded also tended to stifle the initiative and efforts necessary to effectively adopt advanced technology.

FINAL CONCLUSIONS

The case studies each contained elements and conditions vastly different from each other which prevented direct comparison of specific observations. However, both cases provided examples of the effects that capabilities, foundations and traditions might have on a military force's ability to absorb and implement advanced technology. A country's infrastructure must be sufficiently capable of providing support for not only the advanced systems themselves, but for the additional personnel, equipment, facilities, and consumable items necessary to train operators and maintainers, support the systems, and integrate them into the military. The foundation should sufficiently provide a labor pool from which to draw skilled labor, an academic environment that supports rigorous training and implementation of new and technical concepts. The foundation must reward initiative and individual performance, and support a society that advances academic prowess to keep pace with modern technology. Lastly, the traditions of the society must be understood to recognize societal practices that could interfere with training and education, maintenance of systems, and proper employment and adaptation to operational needs.

Without recognizing conditions such as the capabilities, foundations, and traditions, leaders may not fully appreciate how to best tailor technology transfer and coalition operations to account for differences in the two parties. Recognition of the military and society's capabilities to support both the current equipment and systems will provide insight to the potential for supporting advanced technology. In order to train new operators and maintainers on the technology, one must account for and infuse as appropriate the academic foundational practices of the host, while engendering and encouraging the students in a manner to produce the best

results. Lastly, being culturally intelligent beyond the mastery of simple greetings and pleasantries is necessary to identify those obstacles to training and operational employment prior to developing the training and transfer package. Comprehension of these matters should lead to significantly less frustration for the sponsor as well as the host. At worst, the sponsor will be better prepared mentally for barriers he may encounter. At best, efficient transfers and effective training will produce an advanced capability which the host can adequately employ, maintain and sustain, and ideally adapt to the needs of the host military. By achieving this condition, the sponsor intends to improve security in the host' region, thereby moving one step closer to regional and international stability.

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